REMARKS

Claims 1 and 7 have been amended and claims 13 and 14 have been cancelled, without prejudice or disclaimer. Claims 1-12 are pending and under consideration. Claims 1 and 7 are the independent claims. No new matter is presented in this Amendment.

REJECTIONS UNDER 35 U.S.C. §102:

Claims 1-12 are rejected under 35 U.S.C. §102(b) as being anticipated by Yamazaki et al. (U.S. Patent 5,858,823, hereinafter Yamazaki).

Applicants respectfully traverse this rejection for at least the following reasons.

Regarding the rejection of independent claim 1, it is noted that claim 1 recites a thin film transistor (TFT) comprising a lightly doped drain (LDD) region or offset region and a plurality of primary crystal grain boundaries, wherein the thin film transistor is formed so that the primary crystal grain boundaries of a polysilicon substrate are positioned in channel, source and drain regions but not positioned in the LDD or offset region.

Yamazaki discloses a method of forming a channel region of a TFT utilizing one monodomain region (column 12, lines 8-12). The TFT includes forming monodomain regions 103 to 105 adjacent to each other at a grain boundary 100 (FIG. 3A), forming an active layer 106, implanting impurity ions on the active layer 106, forming source and drain regions 107 and 111 (FIG. 3C), and offset gate regions 108 and 110, with the oxide layer 114 around the gate electrode 113 acting as a mask. Yamazaki also discloses forming a channel forming region 109 (FIG. 3C, column 12, lines 41-53). The channel forming region of the TFT is constituted by a region having a structure which is regarded as a single crystal (a monodomain region). Therefore, Yamazaki discloses forming a TFT including a channel region which is free of grain boundaries 100 (column 13, lines 9-11).

Contrary to Yamazaki, independent claim 1 recites forming primary crystal grain boundaries in a channel region.

Accordingly, Applicants respectfully assert that the rejection of claim 1 under 35 U.S.C. § 102(b) should be withdrawn because Yamazaki fails to teach or suggest each feature of independent claim 1.

Regarding the rejection of independent claim 7, it is noted that this claim recites substantially similar subject matter as claim 1. Thus, the rejection of claim 7 is also traversed for the reasons set forth above.

Furthermore, Applicants respectfully assert that the rejection of dependent claims 2-6 and 8-12 under 35 U.S.C. §102(b) should be withdrawn at least because of their dependence from claims 1 and 7 and the reasons set forth above, and because the dependent claims include additional features which are not taught or suggested by the prior art. Therefore, it is respectfully submitted that claims 2-6 and 8-12 also distinguish over the prior art.

Specifically, regarding claims 3 and 9, different processes produce different products as can be seen in the attached images of various crystallization structures due to different crystallization methods. As shown, a structure due to the sequential lateral solidification (SLS) method (b) is different from structures due to an excimer laser annealing (ELA) method (a), a solid phase crystallization (SPC) method (c), a metal induced crystallization (MIC) method (d), a metal induced lateral crystallization (MILC) method (e), and a super grain silicon (SGS) method (f). Withdrawal of the rejection is respectfully requested.

Claims 1, 3-5, 7, 9-11, 13, and 14 are rejected under 35 U.S.C. §102(b) as being anticipated by Oka et al. (U.S. Patent 6,184,541, hereinafter Oka).

Applicants respectfully traverse this rejection for at least the following reasons.

Regarding the rejection of independent claim 1, it is noted that claim 1 recites a thin film transistor (TFT) comprising a lightly doped drain (LDD) region or offset region and a plurality of primary crystal grain boundaries, wherein the thin film transistor is formed so that the primary crystal grain boundaries of a polysilicon substrate are positioned in channel, source and drain regions but not positioned in the LDD or offset region.

The Office Action relies on Oka for a teaching of a TFT comprising a light doped drain (LDD) region (portion of region 4 included in width "d"), and a plurality of primary crystal grain boundaries 2. The Office Action also relies on Oka for a teaching of the TFT being formed so that the primary crystal grain boundaries are positioned in channel 8, source 6 and drain 7 regions but not positioned in the LDD region. The Office Action further states that the portion of region 4 denoted by the width "d" can be considered the LDD region, since the other portion of region 4 was doped with additional impurities during heat treatment (column 3, lines 60-66) and

therefore, the other portion of region 4 would no longer be considered "lightly doped."

Applicants respectfully traverse this characterization of Oka for at least the following reasons.

Initially it is noted that Oka discloses a TFT including a source 6 and a drain 7, each having an LDD structure that has a low concentration region 4 and a high concentration region 5 (FIG. 1B). The low concentration region 4 has a low impurity concentration and the high concentration region 5 has a high impurity concentration (column 3, lines 36-43). In other words, the entire region 4 having a low concentration region is the LDD region, not just a portion "d" of region 4, as alleged in the Office Action.

Furthermore, no where does Oka disclose that the other portion of region 4 was doped with additional impurities during heat treatment, as alleged in the Office Action. At most, Oka discloses that the impurity 14 diffuses from the high concentration region 5 into the low concentration region 4 along the grain boundary when the heat treatment that activates the impurities is provided (column 3, lines 61-64).

Accordingly, not only does the entire region 4 constitute the LDD region but also grain boundaries are present in the LDD region since the impurities diffuse from the high concentration region 5 into the low concentration region 4 along the grain boundaries.

Contrary to Oka, independent claim 1 recites so that the primary crystal grain boundaries of a polysilicon substrate are positioned in channel, source and drain regions but not positioned in the LDD or offset region.

Accordingly, Applicants respectfully assert that the rejection of claim 1 under 35 U.S.C. § 102(b) should be withdrawn because Oka fails to teach or suggest each feature of independent claim 1.

Regarding the rejection of independent claim 7, it is noted that this claim recites substantially similar subject matter as claim 1. Thus, the rejection of claim 7 is also traversed for the reasons set forth above.

Furthermore, Applicants respectfully assert that the rejection of dependent claims 2-6 and 8-12 under 35 U.S.C. §102(b) should be withdrawn at least because of their dependence from claims 1 and 7 and the reasons set forth above, and because the dependent claims include additional features which are not taught or suggested by the prior art. Therefore, it is respectfully

submitted that claims 2-6 and 8-12 also distinguish over the prior art.

Specifically, regarding claims 3 and 9, different processes produce different products as can be seen in the attached images of various crystallization structures due to different crystallization methods. As shown, a structure due to the sequential lateral solidification (SLS) method (b) is different from structures due to an excimer laser annealing (ELA) method (a), a solid phase crystallization (SPC) method (c), a metal induced crystallization (MIC) method (d), a metal induced lateral crystallization (MILC) method (e), and a super grain silicon (SGS) method (f).

Regarding the rejection of independent claims 13 and 14, it is noted that these claims have been cancelled without prejudice or disclaimer. Accordingly, the rejection of claims 13 and 14 is moot. Withdrawal of the rejection is respectfully requested.

CONCLUSION:

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 503333.

Respectfully submitted,

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